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# Communications of the Association for Information Systems



## An Examination of IS Conference Reviewing Practices

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### Abstract:

There has been considerable interest over the years within the IS research community into how to shape articles for successful publication. Little effort has been made, however, to examine the reviewing criteria that make a difference to publication. We argue that, to provide better guidance to authors, more solid evidence is needed into the factors that contribute to acceptance decisions. This paper examines empirically the outcomes of the reviewing processes of three well-known IS conferences held in 2007. Our analyses reveal four major findings. First, the evaluation criteria that influence the acceptance/rejection decision vary by conference. Second, those differences can be explained in terms of the maturity and breadth of the specific conference of interest. Third, while objective review criteria influence acceptance/rejection decisions, subjective assessment on the part of the program committees may also play a substantial role. Fourth, while high scores on objective criteria are essential for acceptance, they do not guarantee acceptance. On the other hand, low scores on any criterion are likely to result in rejection.

**Keywords:** Reviewing, editorial practices, academic research

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## I. INTRODUCTION

Reviewing plays a key role in academia. Reviewers act as gatekeepers to ensure that only the best manuscripts are accepted and that only significant contributions without theoretical and/or methodological flaws appear in print. However, rejection decisions may also lead to discouragement or renunciation [Straub et al., 1994].

A number of authors have examined ways of improving the likelihood of successful publication. Benbasat and Zmud [1999] presented a set of guidelines on how to improve the quality of IS articles. In the hope of encouraging developmental reviews, editorial statements on reviewing practices [e.g., Lee, 1995; Zmud, 1998; Harrison, 2002; Saunders, 2005; Straub, 2009a; 2009b] have attempted to provide further guidelines to IS reviewers by calling for a change in the reviewer mindset from “gatekeeper” to “diamond cutter.”

In this paper, we seek to understand what it takes to produce an ultimately successful manuscript. We do so by going beyond previous subjective viewpoints and recommendations and examining empirically the reviewing practices at IS conferences. Our interest lies in addressing the following issues: What factors currently influence acceptance/rejection decisions? How important are the evaluation review criteria to the final decision? And what factors differentiate accepted and rejected papers? More formally, our research question is: What criteria influence conference acceptance/rejection decisions? We examine these issues by studying 2007 review data from three well-known IS conferences.

In addressing this question, our aim is to provide more solid evidence about actual IS reviewing practices, which, in turn, allows us to contribute to the ongoing debate [e.g., Saunders, 2005; Straub, 2009a; 2009b]. Also, we believe that an appreciation of the relative importance of the evaluation criteria commonly used in IS reviewing can inform prospective authors' future work by allowing them to focus their resources on those criteria likely to result in publication success.

The paper unfolds as follows. In the next section, we introduce our research by justifying our examination of conference review practices, elaborating on our research question in light of those practices, and examining the practices of the three conferences we selected for examination in this study. Next, we present our analyses of the review data. We then discuss our findings and the implications of our research for researchers and editors, and for future research in the area. Finally, we present our conclusions.

## II. SETTING THE SCENE

We first present our reasons for examining the acceptance of conference papers and justify our choice of the three conferences we selected for examination. We then present the conference reviewing practices we examined and further explicate our research question.

### Focus on Conferences

We selected the review practices of conferences rather than journals for four main reasons. First, the deadline-driven submission process of a conference allows a comprehensive comparative analysis of a large number of submissions that are all evaluated within a short timeframe on the same set of criteria. Foreshadowing the results from our study, the three conferences we consider in this paper received a total of almost 900 paper submissions, which were reviewed in timeframes of six to twelve weeks. The volume and compressed timeframe of paper reviews has implications for resource availability, extensiveness of the reviews, as well as time allocated per review. All of these characteristics make conference reviewing practices an interesting focus for our study.

Second, while a conference has a stable cohort of committee members and reviewers, a journal has to deal with changes in the editorial board and acceptance decisions that span a considerable period of time [Straub, 2009a].

Third, there is growing evidence that journal publications are not necessarily representative of the IS field as a whole [Avgerou et al., 1999; Whitley and Galliers, 2007]. Fourth, little research examining scholarly publication has been conducted on conference papers; for example, the majority of citation studies has focused on journal articles [Chan et al., 2006]. Hence, it is important to study conference reviewing practices in addition to those of journals.

We examined the reviewing practices of three IS conferences:

- the 15<sup>th</sup> European Conference on Information Systems (ECIS) 2007
- the 5<sup>th</sup> International Business Process Management Conference (BPM) 2007
- the 26<sup>th</sup> International Conference on Conceptual Modeling (ER) 2007

We selected ECIS due to its standing as one of the world's top three IS conferences, and the fact that it is the largest and most prestigious European IS conference [Whitley and Galliers, 2007]. ECIS 2007 featured sixteen different tracks across a wide range of IS research domains, including IS research methodologies, organizational engineering, e-work, IS security, IS economics, knowledge management, and others. Overall, ECIS 2007 accepted 200 papers from 580 submissions, an acceptance rate of 34.5 percent.

We selected the BPM conference because business process management and the development and use of process-aware information systems is an important IS research domain that is characterized by high relevance to current business and management practice [Dumas et al., 2005]. Major IS conferences (e.g., ACIS 2007/2008/2009, AMCIS 2007/2008/2009, ECIS 2008, HICSS 2008/2009) feature dedicated tracks on business process management in their conference program. Further, business process management has been rated recently as the CIO's number one priority for the fifth straight year [Gartner Group, 2009]. BPM 2007 received a total 152 submissions, of which twenty-two were accepted, an acceptance rate of 14.5 percent.

The ER conference is the most reputable and competitive conference on one of the core research themes in IS, conceptual modeling for IS analysis and design [Wand and Weber, 2002]. It provides the most prestigious annual forum for exploring research, development, novel applications, and industrial innovations in the area of conceptual modeling and associated phenomena. ER 2007 received 159 full paper submissions, thirty-seven of which were accepted, an acceptance rate of 23.3 percent.

## Conference Reviewing

We examine conference reviewing practices and elaborate on our research question in light of those practices. We then examine the review practices of the three conferences we selected for examination.

### Conference Reviewing Practices

To gain insights into the review practices of our three conferences, we approached key members of the respective program or organizing committees, requesting anonymous data on the quantitative evaluations of each of the papers submitted. To ensure anonymity, identifying information (e.g., paper title, author names, qualitative reviews) was stripped from the data prior to analysis.

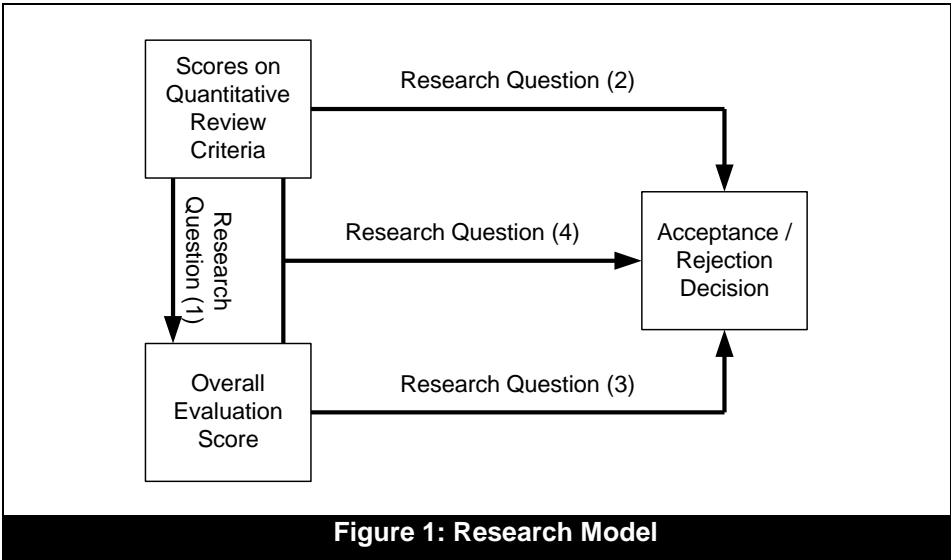
Each conference establishes its own review criteria. Both quantitative and qualitative data typically are used in the reviewing process. First, the program committee requests reviewers to rate papers using well-defined review criteria. Second, reviewers provide an overall evaluation score to aid the program committee members and track chairs in making the acceptance/rejection decision. Third, program committee members and track chairs typically rank the papers based on the overall evaluation score and consider the subjective, written reviews, in addition to the objective scores. Written comments support the reviewer's decision and also provide input to the paper's authors as to how the paper might be improved. Fourth, other factors such as the number of submissions per track, and so on, may also influence the final acceptance decision.

While these four types of data are all instrumental in the reviewing process, we focus on the influence of the scores on the evaluation criteria (i.e., the review criteria, and the overall evaluation of the paper) on the acceptance/rejection decision. We believe this focus is appropriate given that program committees are often required to evaluate hundreds if not thousands of submissions in a short timeframe and are, therefore, likely to pay significant attention to the objective scores. Scores on review criteria and the overall evaluation score are, therefore, a fundamental source of information in the conference decision process that allow us to examine the relative importance of the review criteria. At the same time, such analyses allow us to examine the extent to which subjective considerations come into play in the decision.

### Elaboration of Research Questions

We now further examine our overall research question. Figure 1 presents the research model we use to shed light on the contribution of various factors to the acceptance/rejection decision. We state the following four specific research questions:

1. How do the review criteria scores influence the overall evaluation score?
2. How do the review criteria scores influence the acceptance/rejection decision?
3. How does the overall evaluation score influence the acceptance/rejection decision?
4. How do the combined evaluation criteria scores influence the acceptance/rejection decision?



Review Practices of Selected Conferences

We now examine similarities and differences in the review practices of the three selected conferences. First, as expected, all conferences requested reviewers to score a submission on a number of review criteria. The ECIS review system presented a brief description of the criteria, while the other two review systems simply listed the criteria without further clarification. Some criteria were similar, if not common, across all conferences, e.g., relevance

| Table 1: Conference Evaluation Criteria  |                      |                     |
|--|----------------------|---------------------|
| ECIS 2007  | BPM 2007             | ER 2007             |
| <i>Review Criteria</i>   |                      |                     |
| Theoretical Strength<br>(the strength of the theoretical foundations used, if any)             | Technical Soundness  | Technical Quality   |
| Methodology Used<br>(the quality of the methodology and/or analytical techniques in use)       |                      |                     |
|  | Practical Impact     |                     |
| Significance/Contribution<br>(the likely significance and potential contribution to the field) |                      | Significance        |
| Relevance to ECIS<br>(the submission fit with the theme of the conference and the track)       | Relevance to BPM     | Relevance to ER     |
|  | Originality          | Originality         |
| Presentation<br>(the clarity of organization, the presentation, and the writing)               | Presentation         | Presentation        |
| Appeal to Audience<br>(the likelihood of the paper drawing and keeping an audience)            |                      |                     |
|  | Perceived Confidence | Perceived Expertise |
| <i>Overall Evaluation Score</i>  |                      |                     |
| Overall Rating   | Rating               | Overall Evaluation  |



to the conference theme and presentation. Differences include the fact that ECIS and ER evaluated the significance of the research, while BPM 2007 evaluated practical impact. Second, all review systems requested reviewers to make an overall evaluation of the paper.

There were some differences. For example, the review system of the BPM conference captured the perceived confidence of the reviewer in their judgment. The confidence scores were used to weight the overall evaluation scores. Similarly, the ER review system captured the perceived expertise of the reviewer in order to classify the reviewer's confidence in their overall evaluation. However, because we focus on evaluation criteria in this research, and because BPM 2007 did not use this feature, we did not examine reviewer expertise here.

Table 1 summarizes the evaluation criteria, showing similarities and differences across the conferences. All three conferences used the same rating scheme, that is, criteria were to be rated on a scale from 1 (strong reject) to 7 (strong accept).

### III. DATA ANALYSIS

In the following, we present our analysis of the data. All statistical tests were conducted using SPSS Version 16.0. Findings significant at  $p = 0.05$  appear in bold. We first discuss descriptive statistics. Then, after screening the data for multi-collinearity, we address Research Questions 1 to 4, in turn.

#### Descriptive Statistics

Table 2 presents descriptive statistics for the scores on the evaluation criteria of our three conferences, and Table 3 presents descriptive statistics for the sets of accepted and rejected papers. Perusal of Table 2 shows that for all three conferences the review criterion "Relevance to conference" had the highest mean score across the three conferences, while the mean overall evaluation scores had the lowest. Interestingly, also, "Theoretical strength" and "Methodology used" have the lowest means for ECIS, "Technical soundness" and "Practical impact" for BPM, and "Significance" and "Technical quality" for ER.

| Table 2: Descriptive Statistics of Scores on Evaluation Criteria |                           |             |
|--|---------------------------|-------------|
| Conference   | Review Criterion          | Mean (SD)   |
| ECIS 2007  | Overall Evaluation        | 3.08 (1.07) |
|  | Relevance to ECIS         | 4.46 (1.16) |
|  | Presentation              | 4.12 (1.15) |
|  | Appeal to Audience        | 3.85 (1.12) |
|  | Significance/Contribution | 3.52 (1.12) |
|  | Theoretical Strength      | 3.46 (1.18) |
|  | Methodology Used          | 3.41 (1.21) |
| BPM 2007   | Overall Evaluation        | 3.37 (1.22) |
|  | Relevance to BPM          | 4.97 (1.25) |
|  | Presentation              | 4.01 (1.21) |
|  | Originality               | 3.88 (1.10) |
|  | Technical Soundness       | 3.85 (1.07) |
|  | Practical Impact          | 3.82 (0.98) |
| ER 2007  | Overall Evaluation        | 3.70 (1.05) |
|  | Relevance to ER           | 4.69 (1.06) |
|  | Originality               | 4.23 (0.94) |
|  | Presentation              | 4.10 (0.96) |
|  | Significance              | 4.08 (0.91) |
|  | Technical Quality         | 3.97 (1.06) |

Perusal of Table 3 reveals that the highest means for both accepted and rejected papers for each conference are for "Relevance to conference." While all means of accepted papers exceed the mid-point of the scale, the only means above the midpoint for rejected papers are the three means for this criterion (4.03, 4.81 and 4.43 for ECIS, BPM, and ER, respectively). This result can be interpreted as all IS conference paper submissions being viewed, on average, as relevant to the conference. Note, also, that the means for accepted papers are quite strong on all criteria, significance/contribution, technical aspects, originality, methodology, presentation, in addition to relevance to the conference. As might be expected, differences in the review criteria scores between accepted and rejected papers are significant (at  $p = 0.00$ ).

| Table 3: Descriptive Statistics for Accepted and Rejected Papers |                           |                                |                                |                |
|--|---------------------------|--------------------------------|--------------------------------|----------------|
| Conference   | Review Criteria           | Descriptive Statistics         |                                | t-value (Sig.) |
|  |                           | Accepted Papers<br>(Mean (SD)) | Rejected Papers<br>(Mean (SD)) |                |
| ECIS 2007<br><br>200 Acceptances<br>380 Rejections               | Overall Evaluation        | 4.21 (0.54)                    | 2.49 (0.75)                    | 28.80 (0.00)   |
|  | Significance/Contribution | 4.52 (0.76)                    | 2.99 (0.91)                    | 20.35 (0.00)   |
|  | Theoretical Strength      | 4.43 (0.85)                    | 2.95 (0.99)                    | 17.85 (0.00)   |
|  | Appeal to Audience        | 4.78 (0.79)                    | 3.36 (0.95)                    | 18.13 (0.00)   |
|  | Methodology used          | 4.36 (0.93)                    | 2.92 (1.04)                    | 16.45 (0.00)   |
|  | Presentation              | 4.97 (0.78)                    | 3.67 (1.05)                    | 15.48 (0.00)   |
|  | Relevance to ECIS         | 5.29 (0.82)                    | 4.03 (1.08)                    | 14.48 (0.00)   |
| BPM 2007<br><br>22 Acceptances<br>130 Rejections                 | Overall Evaluation        | 5.32 (0.61)                    | 3.06 (0.98)                    | 10.19 (0.00)   |
|  | Originality               | 5.33 (0.59)                    | 3.65 (0.98)                    | 7.60 (0.00)    |
|  | Technical Soundness       | 5.04 (0.76)                    | 3.66 (0.99)                    | 6.09 (0.00)    |
|  | Practical Impact          | 4.92 (0.75)                    | 3.65 (0.90)                    | 6.11 (0.00)    |
|  | Presentation              | 5.28 (0.49)                    | 3.80 (1.17)                    | 5.70 (0.00)    |
|  | Relevance to BPM          | 5.99 (0.41)                    | 4.81 (1.26)                    | 4.24 (0.00)    |
| ER 2007<br><br>37 Acceptances<br>122 Rejections                  | Overall Evaluation        | 5.12 (0.51)                    | 3.27 (0.76)                    | 13.83 (0.00)   |
|  | Significance              | 5.09 (0.57)                    | 3.77 (0.76)                    | 9.83 (0.00)    |
|  | Technical Quality         | 5.13 (0.66)                    | 3.61 (0.89)                    | 9.56 (0.00)    |
|  | Originality               | 5.18 (0.54)                    | 3.94 (0.84)                    | 8.41 (0.00)    |
|  | Presentation              | 4.97 (0.58)                    | 3.83 (0.89)                    | 7.31 (0.00)    |
|  | Relevance to ER           | 5.54 (0.63)                    | 4.43 (1.03)                    | 6.17 (0.00)    |

### Data Screening

Tables 4a-c show the correlation matrices for each of the data sets. We note that across all conferences, some review criteria are highly correlated (above 0.75), which potentially indicates the presence of multi-collinearity. Although multi-collinearity does not reduce the predictive power or reliability of the analyses, it may affect the individual estimates for effect sizes [Tabachnick and Fidell, 2001]. Therefore, we evaluated collinearity in the analyses that follow.

**Table 4a: Correlation Matrix for ECIS Data**

| Evaluation Criteria           | Acceptance / Rejection Decision | Overall evaluation score | Significance/Contribution | Theoretical Strength | Methodology used | Presentation | Relevance | Appeal to Audience |
|-------------------------------|---------------------------------|--------------------------|---------------------------|----------------------|------------------|--------------|-----------|--------------------|
| Acceptance/Rejection Decision | 1.00                            |                          |                           |                      |                  |              |           |                    |
| Overall evaluation score      | 0.77                            | 1.00                     |                           |                      |                  |              |           |                    |
| Significance/Contribution     | 0.65                            | 0.85                     | 1.00                      |                      |                  |              |           |                    |
| Theoretical Strength          | 0.60                            | 0.79                     | 0.74                      | 1.00                 |                  |              |           |                    |
| Methodology used              | 0.57                            | 0.78                     | 0.68                      | 0.78                 | 1.00             |              |           |                    |
| Presentation                  | 0.54                            | 0.73                     | 0.64                      | 0.65                 | 0.66             | 1.00         |           |                    |
| Relevance                     | 0.52                            | 0.68                     | 0.71                      | 0.53                 | 0.50             | 0.57         | 1.00      |                    |
| Appeal to Audience            | 0.60                            | 0.79                     | 0.81                      | 0.64                 | 0.63             | 0.68         | 0.77      | 1.00               |

<sup>1</sup> Correlations of  $p < 0.01$  are shaded in grey.

**Table 4b: Correlation Matrix for BPM Data**

| Evaluation Criteria            | Acceptance / Rejection Decision | Overall evaluation score | Originality | Technical Soundness | Presentation | Practical Impact | Relevance |
|--------------------------------|---------------------------------|--------------------------|-------------|---------------------|--------------|------------------|-----------|
| Acceptance/ Rejection Decision | 1.00                            |                          |             |                     |              |                  |           |
| Overall evaluation score       | 0.64                            | 1.00                     |             |                     |              |                  |           |
| Originality                    | 0.53                            | 0.80                     | 1.00        |                     |              |                  |           |
| Technical Soundness            | 0.45                            | 0.77                     | 0.67        | 1.00                |              |                  |           |
| Presentation                   | 0.42                            | 0.73                     | 0.62        | 0.72                | 1.00         |                  |           |
| Practical Impact               | 0.45                            | 0.71                     | 0.63        | 0.49                | 0.51         | 1.00             |           |
| Relevance                      | 0.33                            | 0.63                     | 0.48        | 0.37                | 0.46         | 0.51             | 1.00      |

<sup>1</sup> Correlations of  $p < 0.01$  are shaded in grey.

**Table 4c: Correlation Matrix for ER Data**

| Evaluation Criteria            | Acceptance / Rejection Decision | Overall evaluation score | Originality | Significance | Technical Quality | Relevance | Presentation |
|--------------------------------|---------------------------------|--------------------------|-------------|--------------|-------------------|-----------|--------------|
| Acceptance/ Rejection Decision | 1.00                            |                          |             |              |                   |           |              |
| Overall evaluation score       | 0.74                            | 1.00                     |             |              |                   |           |              |
| Originality                    | 0.56                            | 0.80                     | 1.00        |              |                   |           |              |
| Significance                   | 0.62                            | 0.83                     | 0.81        | 1.00         |                   |           |              |
| Technical                      | 0.61                            | 0.82                     | 0.69        | 0.76         | 1.00              |           |              |
| Relevance                      | 0.44                            | 0.66                     | 0.54        | 0.62         | 0.45              | 1.00      |              |
| Presentation                   | 0.50                            | 0.73                     | 0.58        | 0.61         | 0.72              | 0.44      | 1.00         |

<sup>1</sup> Correlations of  $p < 0.01$  are shaded in grey.

### Review Criteria Scores on the Overall Evaluation Score

We first address Research Question 1, which examines the relationship between the review criteria scores and the overall evaluation score. For each data set, we conducted a stepwise linear regression analysis [Tabachnick and Fidell, 2001], using the overall evaluation score as the dependent variable and the review criteria as the independent variables. The three stepwise regressions (one per conference) showed that all of the review criteria scores were significantly associated with the overall evaluation score. Therefore, all of the review criteria entered the three final regression models shown in Table 5, which presents the findings for each conference in decreasing order of criterion contribution.



| Table 5: Regression Analysis of Review Criteria Scores on the Overall Evaluation Score |                                  |   |      |             |           |      |
|--|----------------------------------|---|------|-------------|-----------|------|
| Conference   | Review Criterion                 | Adjusted R <sup>2</sup><br>F (df1, df2) | Beta | p-value     | Tolerance | VIF  |
| ECIS 2007  |                                  | 0.83                                    |      |             |           |      |
|  | <b>Significance/Contribution</b> | F (6, 573) =<br>476.44                  | 0.36 | <b>0.00</b> | 0.24      | 4.14 |
|  | <b>Theoretical Strength</b>      |   | 0.22 | <b>0.00</b> | 0.31      | 3.26 |
|  | <b>Appeal to Audience</b>        |   | 0.16 | <b>0.00</b> | 0.24      | 4.16 |
|  | <b>Presentation</b>              |   | 0.14 | <b>0.00</b> | 0.43      | 2.31 |
|  | <b>Methodology Used</b>          |   | 0.11 | <b>0.00</b> | 0.34      | 2.93 |
|  | <b>Relevance to ECIS</b>         |   | 0.06 | <b>0.02</b> | 0.38      | 2.63 |
| BPM 2007   |                                  | 0.84                                    |      |             |           |      |
|  | <b>Originality</b>               | F (5, 146) =<br>160.55                  | 0.31 | <b>0.00</b> | 0.41      | 2.44 |
|  | <b>Practical Impact</b>          |   | 0.28 | <b>0.00</b> | 0.54      | 1.87 |
|  | <b>Technical Soundness</b>       |   | 0.22 | <b>0.00</b> | 0.39      | 2.55 |
|  | <b>Presentation</b>              |   | 0.21 | <b>0.00</b> | 0.41      | 2.41 |
|  | <b>Relevance to BPM</b>          |   | 0.13 | <b>0.01</b> | 0.67      | 1.49 |
| ER 2007  |                                  | 0.84                                    |      |             |           |      |
|  | <b>Technical Quality</b>         | F (5, 153) =<br>168.34                  | 0.31 | <b>0.00</b> | 0.32      | 3.15 |
|  | <b>Significance</b>              |   | 0.25 | <b>0.00</b> | 0.24      | 4.19 |
|  | <b>Relevance to ER</b>           |   | 0.21 | <b>0.00</b> | 0.60      | 1.67 |
|  | <b>Originality</b>               |   | 0.17 | <b>0.00</b> | 0.33      | 3.07 |
|  | <b>Presentation</b>              |   | 0.16 | <b>0.01</b> | 0.46      | 2.16 |

We first examine collinearity statistics. Multi-collinearity is present when tolerance is close to 0 (Tolerance < 0.01; see Tabachnick and Fidell, 2001) or the VIF is high (VIF > 10), in which case the beta and p coefficients may be unstable. The VIF and tolerance measures, shown in Table 5, suggest that multi-collinearity is not an issue in the data for any of our three conferences. The Appendix further shows that the data also meet accepted criteria for the Condition Index (< 30) and proportions of variance between two or more variables (p < 0.50), both of which also indicate that multi-collinearity is not present.

The results presented in Table 5 are interesting in a number of ways. First, the review criteria consistently explained 83–84 percent of the variance in overall evaluation scores across the three conferences, with each model significant at p < 0.001. The high percentage explained shows that reviewers' overall evaluations are quite consistent with their scores on the review criteria.

Second, the analysis also shows that all review criteria are significant predictors of the overall evaluation score. The contribution of the review criteria varies across the data sets. For ECIS 2007, for example, the effect sizes (measured by the Beta coefficients) vary widely. The most important criterion at ECIS 2007 was significance/contribution ( $\beta = 0.36$ ,  $p = 0.00$ ), with theoretical strength ranking second ( $\beta = 0.22$ ,  $p = 0.00$ ). These findings suggest that ECIS values potentially high impact papers that may have a substantial influence on the IS field. Appeal to the audience, presentation, and methodology used made decreasing contributions to the overall evaluation score. Relevance to the theme of the conference and/or track had a weak impact ( $\beta = 0.06$ ,  $p = 0.02$ ).

The findings for the BPM 2007 conference display more balanced loadings across criteria. Interestingly, originality was the criterion that contributed most to the final decision ( $\beta = 0.31$ ,  $p = 0.00$ ), followed by practical impact ( $\beta = 0.28$ ,  $p = 0.00$ ) and technical soundness ( $\beta = 0.22$ ,  $p = 0.00$ ). Presentation and relevance to BPM (i.e., the conference) followed.

For the ER 2007 conference technical quality was the most significant predictor of acceptance ( $\beta = 0.31$ ,  $p = 0.00$ ), with significance of the research ( $\beta = 0.25$ ,  $p = 0.00$ ) and relevance to the conference ( $\beta = 0.13$ ,  $p = 0.00$ ) next in importance. Originality and presentation were the least important criteria.

### Review Criteria Scores on the Acceptance/Rejection Decision

We now address Research Question 2, which examines the relative importance of the review criteria to the acceptance/rejection decision. To account for potential interaction effects among the review criteria scores, we conducted a stepwise logistic regression analysis [Pallant, 2005] using the scores on the review criteria as the independent variables and the binary acceptance/rejection decision as the dependent variable. The review criteria scores were entered stepwise using the preferred forward LR method, which utilizes the likelihood ratio test (chi-square difference) to estimate the significance of model changes [Tabachnick and Fidell, 2001].

In stepwise logistic regression, several measures of model significance may be used [Hosmer and Lemeshow, 2000]. Table 6 shows such measures for the models of each conference. Specifically, the Hosmer-Lemeshow goodness-of-fit test shows that each of the final regression models is significantly better at determining acceptance/rejection decisions than random chance. The results of the other tests support this finding.

| <b>Table 6: Model Fit for the Effect of Review Criteria Scores on the Acceptance/Rejection Decision</b> |                   |                            |                           |   |
|---|-------------------|----------------------------|---------------------------|---|
| Conference  | -2 Log Likelihood | Cox & Snell R <sup>2</sup> | Nagelkerke R <sup>2</sup> | Hosmer-Lemeshow Goodness-of-fit (chi-square, p) |
| ECIS 2007   | 364.67            | 0.48                       | 0.67                      | (5.30, p = 0.73)                                |
| BPM 2007  | 62.35             | 0.33                       | 0.59                      | (2.81, p = 0.95)                                |
| ER 2007   | 38.96             | 0.57                       | 0.86                      | (2.53, p = 0.96)                                |

Table 7 presents several measures describing the importance of the criteria in each of the final regression models. The significance of each criterion was assessed based on the significance of the Wald statistic [Tabachnick and Fidell, 2001].

| <b>Table 7: Effect of Review Criteria Scores on the Acceptance/Rejection Decision</b> |                                   |      |      |       |             |         |
|---|-----------------------------------|------|------|-------|-------------|---------|
| Conference  | Review Criterion                  | Beta | SE   | Wald  | Sig.        | Exp (B) |
| ECIS  | <b>Significance/ Contribution</b> | 1.12 | 0.25 | 20.50 | <b>0.00</b> | 3.05    |
|   | <b>Theoretical Strength</b>       | 0.75 | 0.1  | 18.02 | <b>0.00</b> | 2.12    |
|   | <b>Presentation</b>               | 0.73 | 0.18 | 16.48 | <b>0.00</b> | 2.07    |
|   | <b>Appeal to Audience</b>         | 0.63 | 0.22 | 8.41  | <b>0.00</b> | 1.88    |
|   | Methodology used                  |      |      |       | 0.11        |         |
|   | Relevance to ECIS                 |      |      |       | 0.19        |         |
| BPM 2007  | <b>Originality</b>                | 2.07 | 0.53 | 15.15 | <b>0.00</b> | 7.96    |
|   | <b>Technical Soundness</b>        | 1.15 | 0.48 | 5.72  | <b>0.02</b> | 3.17    |
|   | Practical Impact                  |      |      |       | 0.09        |         |
|   | Presentation                      |      |      |       | 0.22        |         |
|   | Relevance to BPM                  |      |      |       | 0.26        |         |
| ER 2007   | <b>Technical Quality</b>          | 4.52 | 1.22 | 13.68 | <b>0.00</b> | 91.31   |
|   | <b>Significance</b>               | 2.76 | 1.13 | 5.93  | <b>0.02</b> | 15.74   |
|   | <b>Relevance to ER</b>            | 2.34 | 0.81 | 8.34  | <b>0.00</b> | 10.42   |
|   | <b>Originality</b>                | 1.69 | 0.78 | 4.75  | <b>0.03</b> | 5.42    |
|   | Presentation                      |      |      |       | 0.24        |         |

Perusal of Table 7 leads to the following observations. First, while all review criteria are significant predictors of the overall evaluation of a paper (as shown in Table 5), they are not necessarily significant predictors of the acceptance/rejection decision. The stepwise regression identified a number of review criteria scores that do not significantly influence the acceptance/rejection decision. For ECIS 2007, four of six review criteria significantly influenced the acceptance/rejection decision: "Significance/contribution," "Theoretical strength," "Presentation," and "Appeal to audience." For BPM 2007, just two of five review criteria, "Originality" and "Technical soundness," were significantly associated with the acceptance/rejection decision. Finally, for ER 2007, we found that all review criteria with the exception of "Presentation" significantly influenced the acceptance/rejection decision.

Second, the review criteria that influence the acceptance/rejection decision differ across conferences. We see this, for example, in the common review criteria, "Presentation" and "Relevance to conference." "Presentation" is a significant predictor in the acceptance/rejection decision for ECIS ( $\beta = 0.73$ ,  $p = 0.00$ ), but not for BPM ( $p = 0.22$ ), or ER ( $p = 0.24$ ). Relevance to the conference, on the other hand, is a significant predictor in the acceptance/rejection decision for ER ( $\beta = 2.34$ ,  $p = 0.00$ ), but not for ECIS ( $p = 0.19$ ) or BPM ( $p = 0.26$ ). We further note that the originality criterion is a significant predictor for both BPM and ER, while the significance/contribution criterion is a significant predictor for both ECIS ( $\beta = 1.12$ ,  $p = 0.00$ ) and ER ( $\beta = 2.76$ ,  $p = 0.00$ ).

### Overall Evaluation Score on the Acceptance/Rejection Decision

We now address Research Question 3, which examines the effect of the overall evaluation score on the acceptance/rejection decision. We conducted a logistic regression analysis, using the overall evaluation score as the independent variable and the binary acceptance/rejection decision as the dependent variable. Table 8 shows

goodness-of-fit measures for the models of each conference. The models for BPM 2007 and ER 2007 show adequate fit to the data, while that for ECIS 2007 shows a significant difference between the observed and predicted values of the dependent variable. Specifically, the Hosmer-Lemeshow goodness-of-fit test was significant at  $p = 0.03$ , which indicates poor fit. We exclude the ECIS data from the ensuing analysis.

| Table 8: Model Fit for Effect of Overall Evaluation Score on the Acceptance/Rejection Decision |                   |                   |                  |   |
|--|-------------------|-------------------|------------------|---|
| Conference   | -2 Log Likelihood | Cox & Snell $R^2$ | Nagelkerke $R^2$ | Hosmer-Lemeshow Goodness-of-fit (chi-square, p) |
| ECIS 2007  | 186.49            | 0.62              | 0.86             | <b>(16.65, <math>p = 0.03</math>)</b>           |
| BPM 2007   | 38.90             | 0.42              | 0.76             | (0.80, $p = 1.00$ )                             |
| ER 2007  | 21.70             | 0.61              | 0.93             | (0.30, $p = 1.00$ )                             |

Table 9 presents the measures describing the importance of the overall evaluation score to the acceptance/rejection decision at BPM and ER 2007. The overall evaluation score is a strong and significant predictor of the acceptance/rejection decision for both conferences. We note, however, that the strength of the predictive power of the overall evaluation score varies substantially with that for ER being far stronger than that for BPM (ER 2007:  $\beta = 11.01$ ,  $p = 0.00$ ; BPM:  $\beta = 3.91$ ,  $p = 0.00$ ). Hence, the overall evaluation score has a much greater influence on the acceptance/rejection decision at ER than at BPM.

| Table 9: Effect of Overall Evaluation Score on the Acceptance/Rejection Decision |       |      |       |             |          |
|--|-------|------|-------|-------------|----------|
| Conference   | Beta  | SE   | Wald  | Sig.        | Exp (B)  |
| <b>BPM 2007</b>  | 3.91  | 0.92 | 18.10 | <b>0.00</b> | 49.64    |
| <b>ER 2007</b>   | 11.01 | 3.11 | 12.52 | <b>0.00</b> | 60152.95 |

### Combined Evaluation Criteria on the Acceptance/Rejection Decision

We now address Research Question 4, which examines the relative importance of the combined evaluation criteria to the acceptance/rejection decision. We again used a stepwise logistic regression analysis, this time with both the review criteria scores and the overall evaluation score as the independent variables, and the binary acceptance/rejection decision as the dependent variable. The goodness-of-fit measures shown in Table 10 suggest good fit of the final regression models to the data.

| Table 10: Model Fit for Review Criteria and Overall Evaluation Scores on the Acceptance/Rejection Decision |                   |                   |                  |   |
|--|-------------------|-------------------|------------------|---|
| Conference   | -2 Log Likelihood | Cox & Snell $R^2$ | Nagelkerke $R^2$ | Hosmer-Lemeshow Goodness-of-fit (chi-square, p) |
| ECIS 2007  | 182.49            | 0.62              | 0.86             | (4.65, $p = 0.79$ )                             |
| BPM 2007   | 32.36             | 0.45              | 0.81             | (2.71, $p = 0.95$ )                             |
| ER 2007  | 21.67             | 0.61              | 0.93             | (0.30, $p = 1.00$ )                             |

Table 11 presents the measures reflecting the relative importance of the evaluation scores to the acceptance/rejection decision for the three conferences. Similar to Table 7, Table 11 shows the variables in the final regression model (in bold), and also reports significance levels for the variables excluded from the model. We see from Table 11, that two of seven ECIS evaluation criteria are significant predictors of the acceptance/rejection decision, two of six for BPM, and one of six only for ER.

**Table 11: Effect of Combined Evaluation Scores on the Acceptance/Rejection Decision**

| Conference | Review Criterion              | Beta         | SE          | Wald         | Sig.        | Exp (B)         |
|------------|-------------------------------|--------------|-------------|--------------|-------------|-----------------|
| ECIS       | <b>Overall Evaluation</b>     | <b>6.90</b>  | <b>0.76</b> | <b>82.08</b> | <b>0.00</b> | <b>989.58</b>   |
|            | <b>Methodology Used</b>       | <b>-0.47</b> | <b>0.24</b> | <b>3.85</b>  | <b>0.05</b> | <b>0.62</b>     |
|            | Theoretical Strength          |              |             |              | 0.51        |                 |
|            | Relevance to ECIS             |              |             |              | 0.18        |                 |
|            | Presentation                  |              |             |              | 0.56        |                 |
|            | Significance/<br>Contribution |              |             |              | 0.06        |                 |
|            | Appeal to Audience            |              |             |              | 0.60        |                 |
| BPM 2007   | <b>Overall Evaluation</b>     | <b>6.10</b>  | <b>1.56</b> | <b>14.56</b> | <b>0.00</b> | <b>444.68</b>   |
|            | <b>Technical Soundness</b>    | <b>-2.21</b> | <b>0.98</b> | <b>5.07</b>  | <b>0.02</b> | <b>0.11</b>     |
|            | Originality                   |              |             |              | 0.82        |                 |
|            | Practical Impact              |              |             |              | 0.78        |                 |
|            | Relevance to BPM              |              |             |              | 0.39        |                 |
|            | Presentation                  |              |             |              | 0.75        |                 |
| ER 2007    | <b>Overall Evaluation</b>     | <b>11.01</b> | <b>3.11</b> | <b>12.52</b> | <b>0.00</b> | <b>60152.95</b> |
|            | Originality                   |              |             |              | 0.08        |                 |
|            | Technical Quality             |              |             |              | 0.12        |                 |
|            | Relevance to ER               |              |             |              | 0.83        |                 |
|            | Presentation                  |              |             |              | 0.75        |                 |
|            | Significance                  |              |             |              | 0.18        |                 |

Perusing Table 11, we note that the overall evaluation score is a very strong, significant predictor of the acceptance/rejection decision for all conferences. In fact, only one criterion for ECIS ("Methodology used") and one for BPM ("Technical soundness") also entered the models. However, the negative Betas suggest that the influence of the overall evaluation score dominated the results. Note, also, that these criteria were not particularly strong in our earlier analysis of the influence of the review criteria alone on the acceptance/rejection decision. On the surface, this finding may appear to suggest that the outcomes of IS conference reviewing processes may be manipulated via the overall evaluation scores of the paper submission, independent of the scores given to the other individual review criteria. We will return to this issue in the Discussion section of the paper.

#### IV. DISCUSSION AND IMPLICATIONS

In this research, we examined criteria that influence the acceptance and rejection decisions made at three IS conferences, the 2007 ECIS, BPM, and ER conferences. We focused on conferences due to the significant volumes of data that they deal with in a similar time frame, as shown by the fact that we examined almost 900 papers over the three conferences.

##### Discussion of Findings

We first discuss the contributions of our research and then present our findings in terms of similarities and differences among types of conferences.

##### Contributions of the Research

Table 12 presents a summary of the findings resulting from the examination of our research questions. The contributions of our research are as follows.



**Table 12: Similarities and Differences in Conference Reviewing Based on Research Questions**

| Research Question  | Similarities  | Differences                               |  |                                    |   |
|--|---|---|--|------------------------------------|---|
|  |   | Criterion                                 | ECIS 2007  | BPM 2007                           | ER 2007   |
| 1: How do the scores on the review criteria influence the overall evaluation score?<br>(See Table 4)   | Very strong relationship<br>All criteria strongly significant | <b>Most important:</b>                    | Signif./contribution<br>Theoretical strength                                       | Originality<br>Practical impact    | Technical quality<br>Significance                                   |
|  |   | <b>Least important:</b>                   | Relevance to ECIS<br>Methodology used  | Relevance to BPM<br>Presentation   | Presentation<br>Originality   |
| 2: How do scores on the review criteria influence the acceptance/rejection decision?<br>(See Tables 5 and 6)   |   | <b>Significant criteria:</b>              | Signif./contribution<br>Presentation<br>Theoretical strength<br>Appeal to audience | Originality<br>Technical soundness | Technical quality<br>Significance<br>Relevance to ER<br>Originality |
| 3: How does the overall evaluation score influence the acceptance/ rejection decision?<br>(See Tables 7 and 8)                                       |   | <b>Significance of statistical model:</b> | Not significant  | Significant                        | Significant   |
|  |   | <b>Strength:</b>                          | N/A  | Significant, but relatively weak   | Significant, and relatively strong                                  |
| 4: How do the scores on the review criteria and the overall evaluation score combined influence the acceptance/rejection decision?<br>(See Table 10) | Findings dominated by overall evaluation score                |   |  |                                    |   |

First, as Table 12 shows, our findings highlight the fact that there is a very strong relationship between the review criteria and the overall evaluation score. While we could identify the review criteria that influenced the acceptance/rejection decision, we could not test effectively for the influence of the overall evaluation score on the acceptance/rejection decision because of statistical problems with the model for ECIS. Notwithstanding model fit, it would appear, nonetheless, that the overall evaluation score is also a strong predictor of the acceptance/rejection decision for all conferences.

Second, when both review criteria and overall scores are combined, the overall evaluation score dominates those of the review criteria. We should not, however, interpret this finding as suggesting that in making the acceptance/rejection decision we should use only the overall evaluation score. Based on the strong relationship between the review criteria and the overall evaluation score, it would appear that the review criteria focus the reviewer's attention on the aspects of interest for judging the quality of paper submissions. Eliminating the review criteria in favor of a single overall evaluation score could, therefore, lead to much less effective reviewing outcomes.

Third, in an analogy to the work of Herzberg [1966; 1987], we further examine the evaluation criteria by characterizing them as either "hygiene" or "motivator" factors. Hygiene or support factors are those that need to be in place for motivators to be effective. We believe that the two criteria, "Relevance to conference" and "Presentation," may be characterized as support criteria. In our analysis of the effect of the combined evaluation criteria in differentiating between accepted and rejected papers, these two criteria displayed the smallest (albeit significant) effects, yet the means for each were relatively high (see Table 3). We make further observations with regard to presentation in the following section, below.

With respect to "Relevance to conference," the descriptive statistics presented in Table 2 show that this criterion had the highest means across all three conferences. Note, however, that it was not significant in any of the ensuing analyses. We interpret these findings as suggesting that if a paper were not considered relevant to the conference, it would not have been entered into the review process—a faithful representation of a hygiene or support factor. Therefore, we suggest that "Relevance to conference" is a necessary but not a sufficient criterion for acceptance.

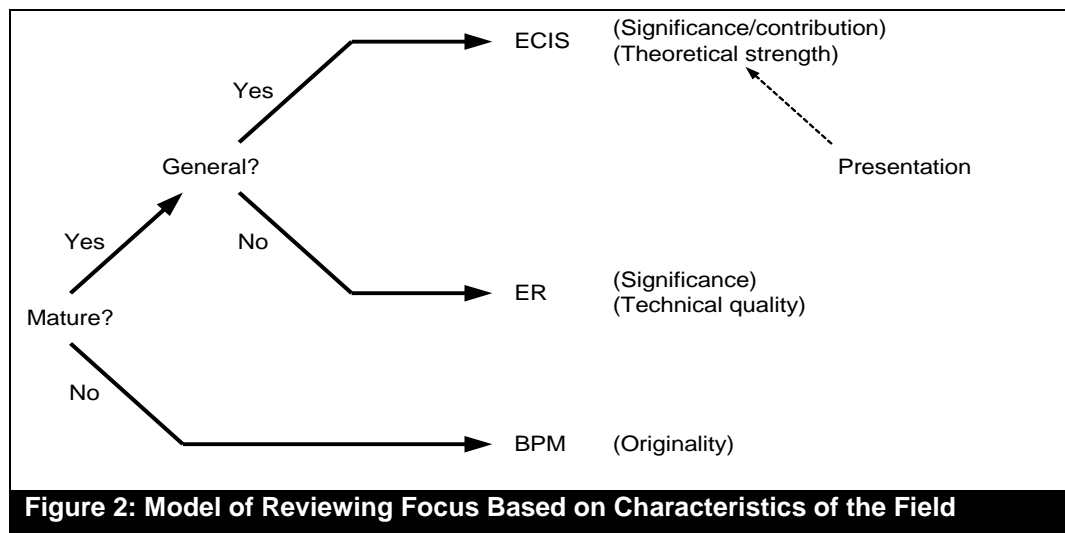


Fourth, there are some indications that factors other than the overall evaluation score and the scores on the review criteria may influence the acceptance/rejection decision. For example, the poor fit to the ECIS data of the regression model of the overall evaluation score on the acceptance/rejection decision may suggest that criteria other than the overall score contribute to the decision. While we lack direct evidence, we believe, based on our own experiences, that decisions made at the conference track level may play a role in this process. Acceptance/rejection decisions are made initially at the track level, and suggestions are provided to the program chair for final examination. The fact that only ECIS 2007 featured dedicated conference tracks lends credence to this notion.

Further, the fact that the overall evaluation score has a much greater influence on the acceptance/rejection decision at ER than at BPM, may suggest that BPM also considers criteria other than the objective ones examined in this research. Our own experience as conference chairs and members of the program committee of the BPM conference suggests that this conference may have more stringent requirements for papers submitted by members of the program committee so as to avoid the perception of committee bias. As an indication of the magnitude of this effect, for BPM 2007, eleven of the twenty-two accepted papers were authored or co-authored by program committee members.

### Integrative Model of Conference Reviewing

To develop a cohesive view of the criteria that influence acceptance/rejection, we sought to characterize our three conferences in a way that would allow us to explain the differences in reviewing emphases that we observed. We believe that reviewing at these three conferences may be characterized by two factors: maturity of the field the conference represents and whether the field targeted is a broad (i.e., general) or a focused (i.e., niche) field. Figure 2 represents this situation pictorially.



**Figure 2: Model of Reviewing Focus Based on Characteristics of the Field**

ECIS is a mature conference that was held for the fifteenth time in 2007 and is intended to appeal to the IS community as a whole; for example, it is viewed as the premier general European IS conference by the Association for Information Systems. As such, reviewing emphasizes the significance of the research and the contribution of the paper to the general community, as well as theoretical strength (Research Questions 1 and 2). Presentation is also quite an important criterion for ECIS because a paper must be well-written to be understandable to a general audience (Research Question 2).

Perhaps a surprising omission in the ECIS review criteria is an emphasis on methodology. The ECIS review criterion was "Methodology Used (quality of the methodology and/or analytical techniques in use)" (see Table 1). For a reviewer who paid little attention to the subtext, the label *methodology used* may have been misleading. The term *methodology used* may suggest that the reviewer is being asked to consider which methodologies (surveys, experiments, case studies, and the like) are more appropriate for ECIS.

Like ECIS, ER is a mature conference in a well-established field; for example, the conference had been held for twenty-five years prior to ER 2007. However, unlike ECIS, it is a niche conference, one that is narrowly focused on very specific issues, in this case, issues pertaining to the conceptual modeling of information systems for analysis and design purposes. We identify important criteria for such a conference as significance of the research and technical quality (see Research Questions 1 and 2). However, note that presentation is not particularly important to ER. We suspect that writing is less of an issue in a well-established niche field because the terminology is well

known and there is a high level of shared understanding within the relevant community. It is, therefore, both easier for authors to produce the research and for the community to interpret it. Note also that originality is one of the lesser criteria of concern for acceptance at ER, reflecting both the maturity of the field and its focused nature.

Immediately then, one can see similarities and differences between ECIS, a mature, well-established general conference and ER, a mature, well-established niche conference. Two conspicuous similarities are the focus on the significance of the research and the theoretical strength or technical quality; that is, in the context of the fields covered by these two conferences, we equate technical quality with theoretical strength. However, while presentation is important to a high quality, general conference such as ECIS, it is much less so to a niche conference such as ER.

Business process management has a much shorter history than either ECIS or ER. In fact, only over the past decade has BPM become a recognized field of study in Information Systems. Hence the BPM conference series, which started in 2003, is far less mature than ECIS and ER. Originality is the single, significant criterion across Research Questions 1 and 2. Practical impact is an important criterion in the relationship between the review criteria and the overall evaluation score (Research Question 1), although it does not have an appreciable effect on the acceptance/rejection decision. Technical soundness, on the other hand, has a significant effect only on the acceptance/rejection decision (Research Question 2). These observations may well be representative of a conference in an area that is not well-established and in which the subject matter or focus is still evolving. One needs to ensure that a new field is not stifled by restricting acceptable research topics and directions.

### Opportunities for Future Research

We can identify a number of opportunities for future research in this area. First, the type of analysis in which we engage for conferences is relevant also for journals. Currently, the field tends to classify journals as first tier, second tier, etc. We would expect that the emphasis in reviewing for one journal would reflect the “quality” of other journals in the same tier. We might also envisage that technical journals would have different emphases from behaviorally- or organizationally-focused journals. Hence, there is ample opportunity to engage in research of a similar nature to what we present here for conferences. In what follows we refer to conference reviewing. However, the reader should keep in mind that our comments are relevant also for journal reviewing.

Second, our examination of three somewhat different conferences allowed us to differentiate the criteria important to acceptance for each of them. Future research should seek to characterize further conferences to build up a more complete picture of the reviewing landscape. This approach would allow the findings for specific types of conferences to be generalized to other similar conferences.

Third, in addition to objective review criteria, it is clear that subjective input also plays a role in the overall acceptance/rejection decision. Such input may come from reviewers, track chairs, members of the program committee, as well as the program chairs. Other criteria, such as paper limits per track, and overall conference acceptance rates imposed on the track chairs, and so forth, may also play a role. Future research could, therefore, examine the influence of subjective inputs and quotas on acceptance/rejection decisions.

Fourth, we also observed significant correlations among the evaluation criteria scores we examined in this paper (see Tables 4a–4c). Hence, certain criteria appear to be inter-related. For example, for ECIS, ratings of the significance/contribution may be related to the scores for theoretical strength and methodology used. Hence, future research could examine the structure of inter-relationships among the review criteria.

Fifth, in a somewhat different approach, researchers could use focus groups, Delphi studies, and surveys of IS academics to gain further insights into what constitutes a manuscript that is likely to traverse the review process successfully. Studies could also be conducted of program committee members and their perceptions of the quality of acceptable papers.

Sixth, future research could examine changes in review practices over time. Such longitudinal studies could, for example, examine the effects of changes in editorial directions over time. We further envisage that such longitudinal studies could lead to guidelines with numerical weightings, thereby increasing the consistency of acceptance/rejection decisions and providing guidance to authors on the criteria of primary importance. This type of reviewing is currently used by the Australian Research Council ([www.arc.gov.au](http://www.arc.gov.au)) to review grant proposals. Both authors and reviewers are informed about the review criteria and their relative importance to the acceptance/rejection decision.

## Implications for Stakeholders in IS Conference Submissions

This paper has a number of implications for authors as well as for conference chairs. First, our research outcomes provide important insights into the 'black box' of conference reviewing practices. Our analyses revealed, for example, that the review focus varies among conferences. Our findings imply, therefore, that authors of conference papers should study carefully the focus, tenets, and, most important, the review criteria of a target conference when shaping their submissions. Our research could, therefore, guide prospective authors in their efforts by increasing the transparency of the review criteria important to a given conference.

Second, differentiating the three conferences we examined based on maturity (established versus emerging) and nature (general versus niche) may help authors identify more suitable publication outlets based on their field of study.

Third, conference chairs and program committees, and, indeed, even journal editors, might review our findings in their continuing task of ensuring acceptance of the most-deserving papers. For example, conferences, and journals alike could conduct an ex-post analysis of their reviews, to assess to what extent certain formal emphases of the outlet (e.g., a strong focus on methodology, or a focus on practical impact) are reflected in actual reviewing outcomes. This reflection of current practices, in turn, may contribute to the ongoing debate about the facilitation, and encouragement, of a balance between rigor and relevance in IS research [e.g., Benbasat and Zmud, 1999; Agarwal and Lucas Jr., 2005; Klein et al., 2006; Recker et al., 2009; Rosemann and Recker, 2009].

## V. CONCLUSIONS

We sought to develop a better understanding of the significance of the criteria used in the IS conference reviewing process based on 2007 data from three selected IS conferences. We identified the objective evaluation criteria (both review criteria and overall evaluation) that influence the acceptance/rejection decision. We then characterized significant criteria in terms of types of conferences, based on whether the topic area covered by the conference is mature or relatively new and whether the field is broad or narrow (niche). The overall quality of submissions can be improved by informing prospective authors of the key criteria that influence acceptance decisions at different types of publication outlets.

We see our research as a starting point in the endeavor to provide pro-active guidance to authors as well as to reviewers and editors regarding the focus of a specific conference, and, therefore, the choice of successful publication outlet. We hope that other scholars will join us in this challenge.

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## APPENDIX: COLLINEARITY DIAGNOSTICS

**Appendix A.1: Collinearity Diagnostics for ECIS 2007**

| Model Dimension | Condition Index | Variance Proportions      |                      |                  |              |           |                    |
|-----------------|-----------------|---------------------------|----------------------|------------------|--------------|-----------|--------------------|
|                 |                 | Significance/Contribution | Theoretical Strength | Methodology Used | Presentation | Relevance | Appeal to Audience |
| 1               | 1.00            | 0.00                      | 0.00                 | 0.00             | 0.00         | 0.00      | 0.00               |
| 2               | 9.58            | 0.00                      | 0.08                 | 0.14             | 0.00         | 0.04      | 0.00               |
| 3               | 12.05           | 0.09                      | 0.02                 | 0.09             | 0.03         | 0.07      | 0.08               |
| 4               | 15.30           | 0.05                      | 0.20                 | 0.01             | 0.66         | 0.00      | 0.02               |
| 5               | 17.03           | 0.00                      | 0.44                 | 0.74             | 0.22         | 0.04      | 0.01               |
| 6               | 19.86           | 0.46                      | 0.17                 | 0.00             | 0.01         | 0.67      | 0.03               |
| 7               | 22.91           | 0.40                      | 0.08                 | 0.00             | 0.09         | 0.18      | 0.87               |

**Appendix A.2: Collinearity Diagnostics for BPM 2007**

| Model Dimension | Condition Index | Variance Proportions |                     |              |                  |           |
|-----------------|-----------------|----------------------|---------------------|--------------|------------------|-----------|
|                 |                 | Originality          | Technical Soundness | Presentation | Practical Impact | Relevance |
| 1               | 1.00            | 0.00                 | 0.00                | 0.00         | 0.00             | 0.00      |
| 2               | 10.13           | 0.02                 | 0.11                | 0.14         | 0.02             | 0.16      |
| 3               | 12.89           | 0.25                 | 0.03                | 0.12         | 0.30             | 0.01      |
| 4               | 13.57           | 0.01                 | 0.06                | 0.15         | 0.01             | 0.56      |
| 5               | 15.81           | 0.39                 | 0.05                | 0.23         | 0.58             | 0.15      |
| 6               | 18.24           | 0.32                 | 0.76                | 0.36         | 0.08             | 0.11      |

**Appendix A.2: Collinearity Diagnostics for ER 2007**

| Model Dimension | Condition Index | Variance Proportions |              |                   |           |              |
|-----------------|-----------------|----------------------|--------------|-------------------|-----------|--------------|
|                 |                 | Originality          | Significance | Technical Quality | Relevance | Presentation |
| 1               | 1.00            | 0.00                 | 0.00         | 0.00              | 0.00      | 0.00         |
| 2               | 12.09           | 0.00                 | 0.00         | 0.18              | 0.17      | 0.05         |
| 3               | 14.65           | 0.03                 | 0.04         | 0.00              | 0.29      | 0.19         |
| 4               | 16.85           | 0.18                 | 0.04         | 0.00              | 0.39      | 0.36         |
| 5               | 20.72           | 0.29                 | 0.00         | 0.67              | 0.05      | 0.38         |
| 6               | 27.14           | 0.49                 | 0.92         | 0.15              | 0.10      | 0.02         |



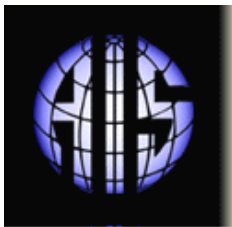
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